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REPORT OF THE 1933 SURVEY OF THE CODY CANYON BARK-BEETLE CONTROL PROJECT WITH RECOMMENDATIONS FOR CONTROL

(Shoshone Nat'l. Forest)

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REPORT OF THE 1933 SURVEY OF THE CODY CANYON BARK-BEETLE CONTROL PROJECT WITH RECOMMENDATIONS FOR CONTROL

INTRODUCTION

In the fall of 1931, control measures were instituted against an outbreak of the Douglas fir beetle (Dendroctonus pseudotsugae) in the Douglas fir stands of the Cody Canyon, Shoshone National Forest. Prior to this time these timber stands had been severely weakenedfrom defoliation by the spruce budworm, which was first reported from the area in 1922. During the first year of this control project, which had as its objective the preservation of the scenic timber values along the roadsides, summer homes, dude ranches and resorts, as well as the commercial value of the timber at stake, some 12,038 infested trees were treated at a cost of $11,937, which included contributed labor to the amount of $2,739. During the summer of 1932, a survey of the infested area showed that an average reduction in the infestation of 53 per cent had followed the institution of control upon the areas treated. However, during this survey several new areas were located which had not been included in the previous season's operation. Control measures were again instituted in the fall of 1932, at which time 8,225 trees were treated at a total cost of $10,919, which also included $2,992 of contributed time.

To ascertain the results secured from the 1932 operation, as well as to determine the need for further control, a survey of the infested areas was again conducted during August, 1933. Prior to the institution of this survey, an extensive reconnaissance was made of the entire area

lying on both sides of the Shoshone River between Mormon and Aspen Creeks. As a result of this extensive reconnaissance, it is sincerely believed that within this unit all spots of infestation within a reasonable distance of the highway have now been located. This report presents the present status of the infestation, recommendations for control, with comments upon last season's operation.

PRESENT STATUS OF BARK-BEETLE INFESTATION

Data depicting the present status of the infestation were secured from a survey of the infested areas by a 3-man crew. Sample strips two chains in width were selected as carefully as possible in order to secure a fair sample, and projected through the infested areas on a fairly accurate compass bearing. Distances were paced in order that the actual acreage covered by these strips might be secured. The 1933-attacked trees recorded on each strip were reduced to an acreage basis and applied to the entire acreage of the area surveyed, in order to secure the total number of infested trees. This region is a difficult one to survey, for not only is the terrain of an exceedingly rough character but the timber stands lie in small bodies separated by high, rocky ridges. The greatest difficulty lies in the fact that the area is unsurveyed, making the determination of the total acreage of each infested unit a rather uncertain procedure. As a result of this uncertain acreage, discrepancies in the estimated totals will undoubtedly exist. A tabulated summary of the results of the 1933 survey follows:

TABLE SHOWING DATA SECURED BY SURVEY

Name of area	Acres	Trees treated 1931	Trees treated 1932	Change in status 1932	Per cent of area surveyed 1933	1933 attacks per A	Total 1933 Attacks	Change in status 1933	Surveyed by
Bloom Cr	144	678	225	-74%	21.6	.21	32	-85%	Evenden, Miller & Spencer
Moss Cr	272	733	291	-60%	9.5	.00	00	-100%	"
Cedar Cr	20	122	57	-53%	24.5	.45	9	- 84%	Miller
Libby Cr	168	46	115	+150%	11.6	1.32	221	+92%	"
Fishhawk	786	275	489	-43%	14.7	.45	354	-27%	Evenden, Miller & Spencer
Chimney Flat	26	198	120	-39%	21.1	.00	0	-100%	Miller
Mesa Cr	171	515	469	-43%	17.0	.68	116	-75%	Evenden, Miller & Spencer
Sheep Cr	265	407	890	+118%	15.2	1.01	267	-70%	"
Blackwater	1,052	4,833	1,369	-71%	12.9	.16	168	-87%	"
June	852	2,271	751	-66%	12.1	.00	0	-100%	"
Beetle	338	1,796	596	-66%	15.8	.09	56	-83%	"
Lower Gulch	30	164	104	-36%	25.0	.29	9	-91%	Miller
Mormon	204	--	40	--	13.8	.49	101	+152%	Miller & Spencer
Newton	95	--	259	--	31.7	.59	54	-87%	Evenden, Miller & Spencer
Cliff Cr	65	--	333	--	22.7	2.16	140	-57%	Miller, Spencer
Gunbarrell	424	--	1,037	--	11.0	1.30	548	-47%	"
Lost Draw	26	--	14	--	30.2	1.46	38	+171%	"
Dead Horse	28	--	136	--	30.2	3.82	107	-21%	"
Chimney Rock Cr	101	--	360	--	15.6	1.77	178	-50%	"
Elephant Head	12	--	39	--	50.0	.33	4	-89%	"
Palisade	140	--	495	--	12.2	1.85	260	-47%	Miller
Libby Flat	49	--	39	--	14.2	.57	28	-28%	"
Aspen Cr	400	--	--	--	6.1	.12	48	--	Evenden, Miller & Spencer
Aspen Ridge	119	--	--	--	21.6	3.35	398	--	"
Little Dead Horse	25	--	--	--	51.2	2.89	72	--	Miller & Spencer
Pioneers	17	--	--	--	45.	4.35	73	--	Miller & Spencer
Totals	5,889						3,291		

SUMMARY OF DATA SECURED

Reduction in infestation on areas treated two years	77%
Reduction in infestation on areas treated one year	45%
Reduction in infestation on entire infestation unit	59%
Reduction in number of trees treated from 1931 to 1932	31%
Reduction in number of trees treated 1932, and those estimated for treatment 1933	64%
Reduction of trees treated in 1931, and those estimated for treatment 1933	75%
Total acreage of areas surveyed	5,889
Per cent of total area covered by 1933 survey	13.6%
Acres treated - 1931	4,257
Acres treated - 1932	5,323
Acres treated - 1933	2,715

DISCUSSION OF AREAS

Blooms Gulch (32 Trees) — 2 years of control

Though a few 1933 attacked trees are now present within this area, the infestation is not sufficiently heavy to justify control, as it constitutes no menace to the project. Spotting and treating were well performed.

Moss Creek (00 Trees) — 2 years of control

Though 9.5 per cent of the total acreage of this area was covered by the survey, with no new attacks being recorded on the sample strips, there are undoubtedly some few 1933 attacked trees. At the extreme upper end of this drainage, at least a mile above the limit of the area previously worked, there are a few spots of 1932-attacked trees. As this area is at least 2-1/2 miles from the highway, and very inaccessible, control measures are not considered necessary. No control is, therefore, recommended for this drainage.

Cedar Gulch (9 Trees) — 2 years of control

As Cedar Gulch lies close to the river and directly opposite the Blackwater Lodge, any infestation within it becomes a potential menace to the more valuable timber stands adjacent. In view of this condition, it is recommended that this small area with its few infested trees be included in this fall's project.

Libby Creek (221 Trees) — 2 years of control

Though a few 1932-attacked trees were observed which had been missed during last season's operation, it is rather difficult to account for the increased infestation which occurred in this unit. However, the acreage is small, and the number of trees involved is not very large so that fluctuations of this character seem to occur more frequently than in larger areas. Control measures are again recommended for this small area.

Fishhawk (354 Trees) — 2 years of control

The results secured in this drainage were not at all satisfactory, as a reduction of only 27 per cent followed last season's operation. This reinfestation is due in part to poor spotting, as several 1932-attacked trees were observed which had been missed, and to the poor burning of many log decks. Control measures will again be necessary for this area, and are so recommended.

Chimney Flat (00 Trees) 2 years of control

No infestation recorded on this area.

Mesa Creek (116 Trees) 2 years of control

Though a reduction in the infestation of 75 per cent followed last season's control, there are still 116 newly attacked trees which should be treated this fall. This reinfestation can be accounted for by trees which were missed entirely, as well as the poor burning of log decks. Control measures are again recommended.

Sheep Creek (267 Trees) 2 years of control

Last fall the acreage of this unit was increased over that covered in 1931, which accounted for the increase in the infestation from 1931 to 1932. Though a reduction in the infestation of 70 per cent followed last season's operation, there are 267 infested trees within this area which should be treated this fall. As in Mesa Creek, trees missed by spotters and poor burning of log decks were no doubt responsible for this year's reinfestation. Control measures are recommended.

Blackwater (168 Trees) 2 years of control

As a result of rather thorough spotting and treating, a reduction in the infestation of 87 per cent followed last season's control. Most of this year's infestation is concentrated on the west fork of Blackwater Creek, some three miles from the Blackwater Resort, and treatment is not believed to be necessary. Control is not recommended for this area.

June Creek (00 Trees) 2 years of control

This area also shows the results of thorough spotting and treating, for though 10.8 per cent of the area was covered by the survey, no 1933-attacked trees were located. Though there are undoubtedly some few infested trees remaining within this area, there are not sufficient to justify treatment. No control is recommended.

Beetle Gulch (36 Trees) 2 years of control

Thorough spotting and treating also resulted in a reduction in the infestation within this area of 93 per cent. Only one tree was recorded which had been missed by the spotters, but two new attacks stood adjacent to it. No control is recommended for this area.

Lower Gulch (9 Trees) 2 years of control

Though in this small area there are a few infested trees, treatment is not considered as being necessary. No control is recommended.

Mormon Creek (101 Trees) 1 year of control

It is difficult to account for the increase of 150 per cent which followed last season's control work, as only one small unburned log deck was recorded. Control measures are recommended.

Newton Creek (84 Trees) 1 year of control

Though a reduction in the infestation of 67 per cent followed last season's control operation, there are still 84 infested trees in this small area which should be treated this fall. Control measures are recommended. There is an area at the extreme head of this drainage containing considerable infestation. This area is very inaccessible, and being remote from the highway, does not constitute a menace to the project; therefore, it is not recommended for control.

Gunbarrell Creek (548 Trees) 1 year of control

As a result of poor work, the infestation within this drainage was reduced only 47% by last season's operation. Poor treating is believed to be responsible for this small reduction, as during the survey four unburned log decks were recorded. As three of these decks occurred on the sample strips, there are perhaps several more in the area. Control measures are again recommended.

Lost Draw (38 Trees) 1 year of control

Though the data from this small area shows an increase of 171 per cent over last year's infestation, there are only 38 infested trees to be treated. It is difficult to account for such unexpected increase, though as previously stated, sharp fluctuations of infestation seemed to occur quite frequently in small areas. This small amount of infestation could easily have originated from a few trees missed or by a poorly burned log deck. Control is recommended.

Dead Horse (107 Trees) 1 year of control

A reduction in the infestation of only 21 per cent followed last season's operation. Poor burning is again believed to be responsible, as many log decks were observed which had apparently been fired but which had not been subsequently checked. Control measures are again recommended for this area.

Chimney Rock Creek (178 Trees) — 1 year of control

Work satisfactory. Control again recommended.

Elephant Head (4 Trees) — 1 year of control

Work satisfactory. Control recommended, as trees are near lodge.

Palisade (280 Trees) — 1 year of control

Work satisfactory. Control recommended.

Libby Flat (28 Trees) — 1 year of control

As last season's operation reduced the infestation within this area by only 28%, control measures are again recommended to care for the few infested trees which are now in the area.

Aspen Creek (48 Trees) — No previous control

This area was not included in last season's operation, though there were a few 1932-attacked trees within the drainage. The data from this year's survey show the infestation has increased very little, if any, as there are only 48 newly attacked trees within this area. Therefore, no control is recommended.

Aspen Ridge (398 Trees) — No previous control

This area, though a part of the Aspen Creek drainage, is being considered as a separate unit. The Aspen Ridge unit lies to the south of Aspen Creek on top of the high divide between Aspen and Clearwater. On this divide there is a small basin of approximately 100 acres of timber which is very heavily infested. The cost of treating this infestation would be extremely high, as from 1-1/2 to 1-3/4 hours would be required for treating crews to reach this area. However, the infested trees are grouped in a small unit, which would perhaps compensate for the inaccessibility of the area. Though there is a question as to the advisability of treating this area, it is being recommended for control.

Little Dead Horse (72 Trees) — No previous control

A few trees in a small accessible area that should be treated. Control recommended.

Rieneckers (73 Trees) — No previous control

A small area with a rather heavy infestation which should be treated. Control recommended.

DISCUSSION OF 1932 CONTROL OPERATION

Spotting

Though as a general rule the spotting was well performed, as evidenced by the very satisfactory results secured, it is believed that improvements can and should be made during this fall's operation. Spotting is the first and most important task of all bark-beetle control projects, and every effort must be made to secure as near 100 per cent of the infested trees as possible. The mechanics of spotting consists in the systematic gridironing of an area in order that all portions of it may be adequately covered. Many variations of this general principle have been adapted to different timber types and terrains. In the Cody Canyon one could hardly hope to adopt a system equally as applicable to both large and small areas. No issues are taken to the methods of spotting as used last season, if they are properly directed. Small areas of 20 to 50 or more acres can be most efficiently worked by a small crew, while in larger units a crew of 5 or 6 men will produce the best results. Regardless of the method used in connection with this project, no spotter should attempt to cover a strip of more than one chain in width. Furthermore, four spotters are all that one chief spotter can adequately supervise as to alignment, correct marking of trees, and so forth. The chief spotter should act in a supervisory capacity only, keeping behind his crew, checking the alignment and work of the regular spotters. Though it is recognized that it is more laborious to run strips across a drainage rather than along a contour, better spotting will result. In spotting Douglas fir trees infested with the Douglas fir

beetle, it is necessary to actually examine the base of every tree on the strip for the presence of boring dust, as that is often the only external evidence. In crossing a drainage, spotters automatically zig-zag back and forth on their strip, and they will examine more trees than if they are traveling along the side of a steep slope which requires them to climb up and down in order to reach all of the trees.

The practice of having one man from the spotting crew drop out and work with the treating crews while each area is being treated is an excellent plan. With the small acreages of the different areas, bounded with such distinct land marks, such a plan eliminates the necessity for an accurate map, which in turn greatly simplifies spotting. Assuming that a method of spotting being used is economical and actually results in all of the area being thoroughly covered, the most important phase of spotting is supervision and inspection. It has been found that without adequate inspection good spotting will not be secured.

Treating

Though many tops from trees treated last season were examined, in only a very few instances were trees found which had not been treated to a sufficient height. The stumps had also been very well peeled and were cut fairly low. However, the burning was not as satisfactory as it could have been. A considerable number of log decks were left unburned, while a larger number were poorly treated. In several areas an attempt had been made to correct poor burning by a thorough peeling of the unscorched portions of each log. Though this action showed a desire on the part of the officers in charge to secure a good clean-up, it does not produce the desired results. It has been clearly shown that a certain

per cent of the beetles successfully overwinter in the peeled bark. During the survey an examination was made of many pieces of peeled bark, which showed that a heavy emergence of the overwintering brood had taken place this spring. Regardless of this fact, it would be far more economical to deck the logs more carefully, which would assure more thorough burns, as it is believed that most poor burns resulted from poor decking.

If burning is not progressive with the decking, the only method which can be adopted to assure the relocation and burning of all decks within an area is to have them numbered and tagged in the same way as infested trees are marked and tagged. A rough sketch map showing the location of the decks for each area should also be made. In this way a check is maintained on the burners as the decks are burned, for the tags are turned over to the camp manager and checked against the deck numbers listed for that particular area. An improvement can be made in the burning which without doubt will be realized in the results secured from this fall's operation. Another phase of the treating which was brought to my attention was the fact that there were instances recorded where fallers had deliberately pulled tags from trees and turned them in as felled and ready for decking. The only reason for such action would be to increase their daily output or to avoid the treatment of trees in difficult areas. There should be no excuse for such an action, and offenders should be very promptly dismissed. To avoid such an occurrence, it is suggested that spotters, in addition to tagging the tree, make a blaze upon the opposite side upon which is placed the tree number with marking crayon.

Too much can not be said about the need for supervision in connection with insect control projects. It has been definitely proved from rather sad experience that the best way to secure effective results in connection with control projects is to give detailed and thorough inspection and supervision. The efficiency of spotting crews increases several per cent when they know that there is a daily check of their work.

RECOMMENDATIONS

The severe defoliation by the spruce budworm during the 1932 season, as well as the presence of countless myriads of adult moths seemed to assure the continuation of further depredation of Douglas fir stands within the Cody Canyon. This situation made the continuation of the Douglas fir beetle control project a rather uncertain procedure, for as long as quantities of weakened host material suitable for bark-beetle attack were being provided through defoliation, success could not be assured. However, the history of previous budworm epidemics indicated that this outbreak had run its course, and that it would soon die down, so on the strength of this promise the continuation of the bark-beetle project was recommended. Fortunately, for the present season at least, this position seems to have been well grounded, as this year's defoliation was very light at the lower elevations, but still rather severe in some of the higher areas. Though from the light defoliation of the past season it would seem that the outbreak had run its course, it is still difficult to attempt a prediction. In 1931, the prediction that the budworm outbreak was dying down was immediately followed by severe 1932 defoliation. However, the present situation

would indicate that there is little chance of further serious depredations by the budworm, and that favorable results should follow the continuation of Douglas fir beetle control.

In considering the institution of bark-beetle control for this fall, it is assumed that the project is still justified on the same basis as during previous seasons. It is, therefore, recommended that the sum of $3,750.00 be allotted for the control of the Douglas fir beetle within the following areas of the Cody Canyon, and that work be instituted in September:

TABLE OF AREAS TO BE TREATED

Name	Acres	Number of trees
Cedar Gulch	20	9
Libby Creek	168	221
Fishhawk Creek	786	354
Mesa Creek	171	116
Sheep Creek	265	267
Mormon Creek	204	101
Newton Creek	95	84
Cliff Creek	65	140
Gunbarrell Creek	424	548
Lost Draw	26	38
Dead Horse	28	107
Chimney Rock Cr	101	178
Elephant Head	12	4
Palisade Creek	140	260
Libby Flat	49	28
Aspen Ridge	119	398
Little Dead Horse	25	72
Rieneckers	17	73
Totals	2,715	2,998

Infested Trees per Acre - 1.10

In attempting to determine the actual cost of this fall's operation, it has been assumed that sufficient contributed labor can again be secured to care for a major portion of the spotting charges as during previous operations. If this assistance is not available, it will no doubt be necessary to increase my requests for funds proportionately.

As the number of trees to be treated this fall has been materially reduced, it may appear that the infested trees will be badly scattered over a large acreage, which would increase the cost of treatment. However, there is but little difference in the density of the infestation as estimated for 1933 and that treated in 1932, as the acreage to be treated has been reduced by some 46 per cent.

This year's project will be much smaller than during the previous seasons, and will not need such a large organization. It is suggested that the work be instituted with a very small crew, and increased to a maximum as the work progresses.

Respectfully submitted,

James C. Evenden

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Entomologist

August 26, 1933.